

**REMARKS/ARGUMENTS**

In the final Office Action dated April 5, 2006, Claims 1-16 and 18-25 are pending. The Examiner rejects Claims 1-16 and 18-25 under 35 U.S.C. § 103(a) as being unpatentable over the admitted state of the prior art in view of U.S. Patent No. 5,893,683 to Johnson, U.S. Patent Application Publication No. 20020168241 to David et al., and U.S. Patent Application Publication No. 20050015980 to Kottilingam et al.

Applicants respectfully submit that independent Claims 1 and 13 are patentably distinguishable from the cited references. Therefore, in light of the subsequent remarks, which do not raise new issues, Applicants respectfully request reconsideration and allowance of the claims.

Independent Claim 1 recites routing a portion of the workpiece including the defect such that routing removes the defect and at least a portion of the workpiece proximate to the defect. The routing step includes controlling a depth to which the workpiece is routed with a micro-stop countersink apparatus, wherein routing further comprises controlling the routing such that at least a portion of the routed portion of the workpiece is defined by a sidewall and a conical bottom surface extending angularly from the sidewall. Independent Claim 13 recites that the router bit contacts the defect and the area proximate to the defect in a direction generally orthogonal to the workpiece to remove the defect and at least a portion of the workpiece proximate to the defect. Moreover, independent Claim 13 recites that the routed portion is defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall.

Applicants refer to the previous Amendments filed October 14, 2005 and February 20, 2006 for a brief discussion of the Johnson, David, and Kottilingam references. With respect to the Applicants' argument that there is no teaching or suggestion to combine Kottilingam with Johnson or David, the Examiner finds that while Kottilingam does not disclose completely removing a crack, Kottilingam does "not teach away from the present application or the admitted state of the art, because the groove formation and fusion results look to the thermal spray filling method, not the exact location of the groove." Moreover, the Examiner rejects Applicants' argument that none of the cited references disclose a routed portion that includes a sidewall and

conical bottom surface extending angularly from the sidewall, as the combination of cited art allegedly discloses such a configuration.

Applicants respectfully disagree and submit that independent Claims 1 and 13 are distinguishable from the cited references, taken individually or in combination. In particular, none of the cited references, taken individually or in combination, discloses controlling the routing such that a routed portion includes a sidewall and a conical bottom surface extending angularly from the sidewall, as recited by Claim 1, or a routed portion that is defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, as recited by Claim 13. As shown in FIG. 7 and 7a of the present application, the routed portion includes a sidewall **20** and conical bottom surface **22**.

Conversely, and as shown in Figure 5 of Johnson, the routed portion includes a vertical sidewall and a horizontal bottom surface joined by a rounded edge within the workpiece, which is specifically distinguished in the Background of the present application. Figure 5 of Johnson clearly shows a routed portion that includes rounded edges, which is unlike the claimed invention, where sharp edges or corners may be formed between the sidewall and the conical bottom surface.

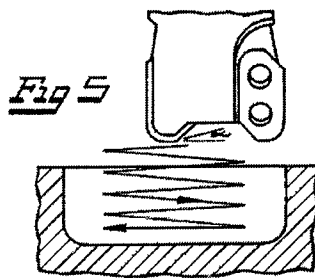


FIG. 5 of Johnson

Johnson discloses that the opposite corners of the cutting edges may be left square like that shown at the lower end of Figure 4a (col. 2, lines 64-65). Even assuming that “left square” corresponds to an angular cutting edge (an assumption with which Applicants do not agree), Johnson does not teach or suggest forming a conical bottom surface within the workpiece. In fact, Johnson discloses that the cutter head includes an axial depression that would prohibit the cutting inserts from forming a conical bottom portion in the workpiece. Johnson discloses that the axial depression “in the form of a truncated cone is turned in the end face to provide clearance for the ramping entry of the router into the workpiece at the angle  $\alpha$  indicated in FIG. 1

and again in FIG. 5” (col. 2, lines 44-47). As such, the combination of the truncated cone and flat bottom cutting edge of Johnson teach away from forming a routed portion having a conical bottom surface defined in the workpiece, as recited in independent Claims 1 and 13.

Moreover, the Examiner relies upon Kottilingam as disclosing a conical bottom surface. Applicants submit that Kottilingam does not teach or suggest a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall, as recited by independent Claim 1, or a routed portion defined by a sidewall that is generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, as recited by Claim 13. In this regard, Kottilingam discloses that the preparatory groove may be “generally conical shaped [to] promote better fusion, although other geometries could be used such as U-shaped, oval, circular, and the like” (¶ 21). Figure 2 of Kottilingam apparently illustrates a “U-shaped” groove and does not provide a figure for a conical shaped groove. Regardless, Kottilingam does not teach or suggest that the conical shaped groove would otherwise extend angularly from a sidewall extending within a workpiece or from a sidewall extending generally orthogonal to the workpiece.

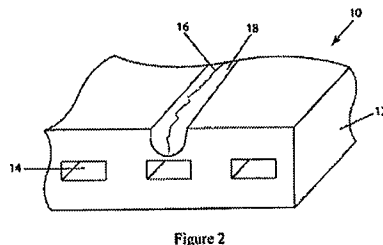


FIG. 2 of Kottilingam

Furthermore, David does not disclose a specific profile of the routed portion and, thus, also does not teach or suggest a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall or by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, as recited by independent Claims 1 and 13, respectively.

As none of the references discloses a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall, or a routed portion defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, the combination of the references also fails to teach or suggest independent Claims 1 and 13 of the present application. Therefore, the rejections of independent Claims 1 and 13

under 35 U.S.C. § 103(a) over the cited references are overcome. As such, it is submitted that the pending dependent claims are allowable for at least those reasons discussed above with respect to independent Claims 1 and 13, respectively.

Moreover, although the dependent claims are distinguishable from the cited references for at least those reasons discussed above in conjunction with independent Claims 1 and 13, Applicant submits that the dependent claims include additional recitations that further patentably distinguish the claimed invention. For example, none of the cited references teach or suggest dependent Claims 6 and 19, which recite that a router bit includes cutting edges with a relief angle of less than 3 degrees. The Examiner relies on Johnson as disclosing Claims 6 and 19, but the present application discloses that the shape of the conical bottom surface is defined by the relief angle of the cutting edges (p. 8, lines 27-28). Figure 3 of the present application clearly illustrates the relief angle A. Thus, the conical bottom surface of the routed portion may define an interior angle of greater than 174 degrees (see p. 8, lines 16-19). "Routing using a small relief angle A ensures that a minimal amount of area 18 proximal to the defect 12 is removed" (p. 8, lines 24-25).

In contrast, Johnson does not disclose a relief angle of less than 3 degrees, as recited by dependent Claims 6 and 19. In fact, Johnson does not disclose a relief angle at all, as the routed portion of Johnson defines a flat bottom surface. Moreover, the area removed by the router of Johnson is substantially larger than the shallow cut of the claimed invention. Furthermore, even though Kottlingam discloses a conical shaped groove, there is no teaching or suggestion as to the magnitude of the relief angle, and David also does not disclose specific relief angles of the router. The shallow relief angle (i.e., less than 3 degrees) ensures that a minimal amount of material is removed during routing, which is unlike the cited references. Therefore, Applicant submits that dependent Claims 6 and 19 are further distinguishable from the cited references.

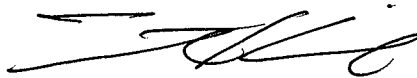
Appl. No.: 10/763,647  
Amdt. dated 07/05/2006  
Reply to Office action of 04/05/2006

### CONCLUSION

In view of the remarks presented above, which do not raise new issues, Applicants submit that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON July 5, 2006.